DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moriguchi et al. (US Patent 4,536,550). Moriguchi et al. teaches a multimodal polyethylene composition with a density of 0.935-0.965 g/cm^3 (column 9, line 66-column 10, line 1) which comprises 35-45% by weight of low molecular mass polyethylene polymer A (column 2, lines 52-60 and Table 2), 34-44% by weight of a high molecular mass copolymer B made from ethylene and a first 1-olefin comonomer with from 4 to 8 carbons (column 2, lines 52-60, column 3, lines 28-29, and Table 2), and from 18-26% by weight of an ultrahigh molecular mass copolymer C containing a second 1-olefin comonomer (column 2, lines 52-58, column 3, lines 8-10 and Table 2). Moriguchi et al. further teaches that the MFR of 0.5-3.0 dg/min (column 10, lines 3-5) for injection blow molding, and an MFR of from 0.005-1 dg/min for blow or extrusion molding. Moriguchi et al. does not teach that the stress crack resistance is 150-220 hours. It is well known in the art to maximize the stress crack resistance, in order to form more durable products. It would have been obvious to a person of ordinary skill in the art to use routine experimentation to modify the composition taught by Moriguchi et al. in order to result in the desired stress crack resistance.

Regarding claim 2, Moriguchi et al. does not teach the specific amounts of comonomers. However, as evidenced by MPEP §2144.05, differences in concentration do not support patentability, absent a showing of criticality. It would have been obvious to a person of ordinary skill in the art to use routine experimentation to optimize the amount of comonomer in order to obtain the desired characteristics in the finished product, such as cost, durability, appearance, etc.

Regarding claim 3, Moriguchi et al. teaches the instantly claimed comonomers (column 2, lines 56-58).

Regarding claim 5, Moriguchi et al. does not teach the instantly claimed characteristics. It is well known in the art to maximize characteristics such as impact strength, in order to form more durable products. It would have been obvious to a person of ordinary skill in the art to use routine experimentation to optimize the composition taught by Moriguchi et al. in order to result in the desired characteristics in the finished product, such as cost, durability, appearance, etc.

3. Claims 4, 6, 7, and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moriguchi et al. (US Patent 4,536,550) in view of Berthold et al. (US Patent 6,713,561). Moriguchi et al. teaches a multimodal polyethylene composition with a density of 0.935-0.965 g/cm^3 (column 9, line 66-column 10, line 1), and a MFR of 0.5-3.0 dg/min (column 10, lines 3-5), which comprises 35-45% by weight of low molecular mass polyethylene polymer A (column 2, lines 52-60 and Table 2), 34-44% by weight of a high molecular mass copolymer B made from ethylene and a first 1-olefin comonomer with from 4 to 8 carbons (column 2, lines 52-60, column 3, lines 28-29, and Table 2), and from 18-26% by weight of an ultrahigh molecular mass copolymer C containing a second 1-olefin comonomer (column 2, lines 52-58, column 3, lines 8-10 and Table 2). Regarding claims 4, 7, 9, 11, and 12, Moriguchi et al. does not teach the instantly claimed viscosities. Regarding claim 6,

Moriguchi et al. does not teach the instantly claimed method of polymerization in three stages, although Moriguchi et al. does teach the organoaluminum catalyst (Example 1-1). Berthold et al. teaches a multimodal polyethylene molding composition which is obtained by polymerization of monomers in three phases using a Ziegler catalyst (Example 1) in suspension at temperatures of 20-120°C, where the viscosity VN_1 is 55-100 cm^3/g (Table 2) and viscosity V_{tot} is 306-392 cm^3/g (Table 2). It would have been obvious to a person of ordinary skill in the art to use the method of polymerization taught by Berthold et al. to modify the method taught by Moriguchi et al. in order to obtain the desired polymer with optimum characteristics. The motivation to use the teachings of Berthold et al. to modify Moriguchi et al. is that both are in the same field of endeavor, that of making multimodal polyethylene products.

Further regarding claim 6, and regarding claim 10, Moriguchi et al. does not teach that the stress crack resistance is 150-220 hours. It is well known in the art to maximize the stress crack resistance, in order to form more durable products. It would have been obvious to a person of ordinary skill in the art to use routine experimentation to modify the composition taught by Moriguchi et al. in order to result in the desired stress crack resistance.

Regarding claim 8, Moriguchi et al. does not teach the instantly claimed viscosity numbers. However, the numbers clearly fall between the first and final numbers taught by Berthold et al. Therefore, the method taught by Br would of necessity encompass the instantly claimed viscosity numbers as the polymerization progressed between the stages.

Further regarding claim 10, Moriguchi et al. does not teach the blow molding steps as instantly claimed. Berthold et al. teaches blow molding the polyethylene composition by plasticizing in an extruder at a temperature of 200-250°C, extruding, blow molding, and cooling (column 10,

lines 3-8). It would have been obvious to a person of ordinary skill in the art to use the method taught by Berthold et al. to modify the method taught by Moriguchi et al. in order to form a finished product from the polyethylene composition.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suzanne E. McDowell whose telephone number is (571) 272-1205. The examiner can normally be reached on Monday and Thursday 8:30-4, Wednesday 6-4:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Suzanne E. McDowell/
Primary Examiner, Art Unit 1791

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